

REMARKS

Entry of the foregoing amendment and reconsideration of this application are requested. Claims 1, 7 and 10 have been amended, claim 11 has been cancelled and claims 12 and 13 have been withdrawn. Claims 14 and 15 have been newly added and claims 1-10 and 14-15 are now pending in the application.

The objection to claims 1 and 7 has now been rectified by following the suggestions of the Examiner.

Claims 1-10 have been rejected under 35 USC §103(a) as being unpatentable over Deeba '825 in view of Foster '792. Claim 11 has been rejected under 35 USC §102(b) as being anticipated or, in the alternative, under 35 USC §103(a) as being obvious over Gonzalez-Martin '186.

Independent claim 1 has now been amended as suggested by the Examiner. Claim 1 has been further amended in the oxidizing step to receive "to thereby enhance activity of said metal." The basis for this amendment is found in the specification at page 12, lines 14-15. The amendment basis for amended claim 10 is found at page 7, lines 12-13.

Newly added claim 14 is based on the description on page 9, lines 17-18.

Newly added claim 15 is based on the description on page 9, lines 5-7.

In Deeba (USP 5,145,825), there is no description about oxidation, in a heating atmosphere, of a metal obtained by reducing a compound of the metal by hydrogen. Claim 6 (Deeba) recites that a titanium or zirconium salt is calcined in an oxygen-containing gas. However, this process is for obtaining the respective metal oxide, i.e. titania or zirconia, and is never for oxidizing "previous metal" recited in claim 1 (Deeba). This interpretation is evident from the description of "The starting materials . . . as air." at column 3, lines 35-39.

On the other hand, at column 3, lines 56-58, there is the description of "which corresponding oxide can be formed prior to previous metal addition, subsequent to previous metal addition . . .". Since this "corresponding oxide" is the titanium or

zirconium oxide, Deeba suggests that the oxidation may be carried out subsequent to "previous metal addition." In this case, when oxidizing silica coated with the titanium or zirconium compound for obtaining the titanium or zirconium oxide, it may be possible that the precious metal is resultantly subject to oxidation.

However, in the case where a carrier already carrying titania is made to further carry a metal adapted to exhibit thermal catalytic activity (e.g. platinum), since the titania is already obtained, it is meaningless to expose this carrier to a heating gas atmosphere containing oxygen. As described later in EXAMPLE 1 (Deeba), "previous metal addition" is achieved by solution reaction. Accordingly, if the obtained previous metal is oxidized, it is expected that the radius increases and thus the activity is lowered. Therefore, there is no possibility that an expert having read this description of Deeba exposes the carrier carrying titania and platinum to the heating gas atmosphere containing oxygen.

What is more important is that the present inventors have noticed that when, for example, platinum is obtained by reducing a platinum compound by hydrogen, the platinum is in an "extremely strong reduction state" and thus sufficient activity cannot be obtained and have found that high activity can be obtained by oxidizing this platinum. That is, when the platinum compound is reduced by hydrogen, the raft-shaped crystal structure is formed so that high activity is not obtained, while, when the oxidation is carried out thereafter, bonds in the raft-shaped crystal structure are cut so that high activity is obtained. This is a problem unique to platinum (thermal catalytic metal) obtained by hydrogen reduction.

On the other hand, in Deeba, there is no description about a previous metal reduced by hydrogen and, for example, as described in EXAMPLE 1, platinum is fixed on the carrier by the solution reaction. That is, the platinum is obtained by reacting Pt amine salt with an acetic acid solution. The platinum thus obtained is not subjected to the problem of the reduction in activity due to the "extremely strong reduction state" caused by the hydrogen reduction. Therefore, it is meaningless to oxidize the platinum. In

Appln. No. 10/784,348
Amdt. Dated July 26, 2006
Reply to Office Action of March 29, 2006

EXAMPLE 1, the catalyst is finally calcined at 500°C. However, this heating treatment is carried out for removing acetic acid and so on remaining after reacting the Pt amine salt with the acetic acid solution, and never for enhancing the activity of the platinum. As described above, if this platinum is oxidized in the heating atmosphere, the increase in grain size is expected. Therefore, it is believed that the heating treatment is carried out in an inert gas atmosphere.

On the other hand, if the platinum compound is reduced by hydrogen in a heating atmosphere, no impurities remain in a catalyst and, hence, heating is not necessary. Consequently, with respect to the platinum obtained by the hydrogen reduction, there is no possibility of carrying out the oxidation in the heating atmosphere without the particular perception as described above.

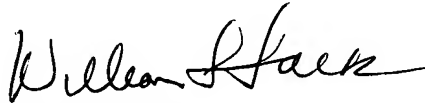
Accordingly, even if it is known to reduce a previous metal catalyst as taught by Foster (USP 4,076,792), it should not be obvious even for an expert to reach the method of oxidizing the metal, obtained by hydrogen reduction, in the heating atmosphere so as to enhance the activity thereof, on the basis of the description of Deeba.

A discussion of the cited reference to Gonzalez-Martin is not necessary since claim 11 has been cancelled.

It is requested that the Examiner withdrawn the rejections and pass this application to issue with claims 1-10 and 14-15 being deemed allowable.

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